

Massachusetts Bays National Estuary Program

Proposed Workplan
July 1, 2015 to June 30, 2016

June 19, 2015

The Massachusetts Bays National Estuary Program (MassBays) is pleased to submit this application for funding to implement our Federal Fiscal Year 2015 Workplan. We look forward to another successful year, building on this year's accomplishments, including:

- ✕ Hosting the 2015 State of the Bays Symposium, which brought 100 attendees to a day-long event packed with information about conditions and trends across Massachusetts Bay and Cape Cod Bay.
- ✕ Providing critical interagency coordination and recruiting hundreds of volunteers to conduct surveys, monitoring, stormwater management, and outreach and education, leading to restoration and enhancement of nearly 500 acres of estuarine habitat.
- ✕ Producing a Public Review Draft of our Comprehensive Conservation and Management Plan, the culmination of a two-year program of stakeholder outreach and strategic planning.
- ✕ Building on our baseline of \$568,000 EPA §320 funding, securing \$542,000 in matching resources and leveraging almost \$6 million in additional resources.
- ✕ Soliciting applications for a new Metro Boston Regional Service Provider, to better serve Boston-area stakeholders and advance habitat protection and restoration in the region.
- ✕ Working with EPA staff at Headquarters and TetraTech engineers, producing a stormwater treatment and control handbook specific to coastal Massachusetts municipalities, and a series of technical workshops.

EPA has been especially generous with their technical support this year, not only with regard to the stormwater handbook, but through Region 1's assistance in bringing together the New England NEPs for joint discussion and planning. MassBays is committed to continuing these efforts to maximize the impact of individual NEP's activities to benefit the entire region.

Thank you for your continued commitment to our work in the Massachusetts and Cape Cod Bays. Please do not hesitate to contact us if you have any comments, suggestions, or concerns regarding the workplan.

Sincerely,



Pam DiBona
Executive Director
Massachusetts Bays National Estuary Program
pamela.dibona@state.ma.us
617-626-1204



Samantha Woods
Management Committee Chair
North and South Rivers Watershed Association
samantha@nswra.org
781-659-8168

cc: Bruce Carlisle, EEA/CZM
Regina Lyons, EPA/Region 1

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A. Summary

2014 to 2015 Progress

Over the past year, MassBays exceeded its ambitious targets for habitat restoration with 498.5 acres restored, and leveraged more than 300% of EPA's investment in the program. We led efforts to bring additional Federal funds to habitat restoration efforts, \$148,000 from NOAA under the Coastal Zone Projects of Special Merit grant program, and \$2.9 million under the National Fish and Wildlife Federation's Hurricane Sandy grant program. The National Estuary Program's voice in the region was amplified through our contributions to establish the Northeast Integrated Sentinel Monitoring Network, monetary and in-kind support to sub-regional conferences, a successful State of the Bays Symposium, and two new interactive tools on our website that bring new information to bear on local decisionmaking.

See Section A, Completed Major Projects, for more detail.

2015 - 2016 Goals

MassBays completed a two-year process to set out goals, strategies and action plans which will serve as the framework for a final CCMP. While completing that document is a component of this year's workplan, work proposed for the current fiscal year is tied to the outcomes articulated there. They are:

1. MassBays provides new resources for research and management in the Bays.
2. MassBays reaches all planning-area municipalities with actionable information about estuaries.
3. MassBays provides regular and locally informed State of the Bays reporting that reflects the unique characteristics and progress toward targets for planning area embayments.

These outcomes represent improved position and capacity for MassBays to continue and augment our ongoing efforts to mitigate and halt chronic impacts on the region's estuarine habitats posed by five Critical Impact Areas:

- Contaminated and uncontrolled stormwater runoff
- Wastewater discharge
- Barriers to streamflow and tidal flushing
- Climate change
- Spread of invasive species

Because of our large and diverse region, as well as the need to maximize \$320 funds through external match, MassBays and its host agency (MA Office of Coastal Zone Management) solicit Regional Service Providers to host Regional Coordinators in five sub-regions. It is in the sub-regions – which encompass 47 embayments in the MassBays National Estuary Program – where on-the-ground work with municipal and other partners takes place. “Central Staff” (Executive Director and Staff Scientist) look across sub-regional efforts to identify and share best practices, and connect to initiatives at the regional, state, Gulf of Maine, Northeastern, and national scales to foster joint monitoring, education, and outreach efforts. Specific sub-regional and region-wide projects are proposed in Section B, New and Ongoing Projects.

Staffing

Executive Director Pam DiBona is responsible for the overall management of the program, including administration of grants and contracts, including reports to EPA and other funders; staff supervision, including oversight of Regional Service Providers in line with contracts; and organizational development, including strategic planning through the CCMP update, work with the Management Committee to set priorities for the program, and developing partnerships that result in diversified funding for the program. She also produces education and outreach materials, including two MassBays e-newsletters.

Staff Scientist Prassede Vella works half time with MassBays and half time with our host agency, CZM, as an Ocean Management Specialist. Ms. Vella is responsible for coordination of the Research and Planning Grant Program, staffs the Science and Technical Advisory Subcommittee to our Management Committee, and serves as technical expert for MassBays planning and reporting efforts.

Regional Service Providers connect MassBays with our region's communities. Under grants from MassBays (awarded through a competitive bidding process), each RSP designates a Regional Coordinator, in turn responsible for identifying regional priorities consistent with the outcomes articulated in the CCMP, and implementing the annual workplan at the local level. RSPs are hosted by regional planning agencies or nonprofit organizations located in each sub-region. For FY2015, grants have been recommended for the following regional organizations:

- The Merrimack Valley Planning Commission: Upper North Shore Region
- Salem Sound Coastwatch: Lower North Shore Region
- Northeastern University Marine Science Center: Metro Boston Region
- The North and South Rivers Watershed Association: South Shore Region
- The Association to Preserve Cape Cod: Cape Cod Region

Budget Overview

A detailed budget request and narrative are included in Section D; a summary is included here.

FFY15 Section 320 Grant Application: Massachusetts Bays National Estuary Program Proposed Expenditures and Confirmed Non-Federal Match	
Personnel	
Salaries	\$126,055
Fringe @ 30.82% (salaries)	\$38,850
subtotal, salaries & fringe	\$164,905
Travel	
subtotal, travel	\$5,487
Contractual	
Regional Service Providers	\$293,728
CCMP implementation grants	\$111,000
subtotal, subgrants	\$404,728
Other Expenses	
subtotal, other expenses	\$6,426
Indirect	
Indirect Charges @ 14.64% (salaries)	\$18,454
Total Request, FFY15	\$600,000
Matching Funds	
Direct Match from RSPs	\$150,151
Direct Match from CCMP Grant recipients	\$27,750
Direct Project Match	\$422,222
Total Match, FFY15	\$600,123

B. Completed Major Projects and Activities

MassBays has many successes to report from the past year of grant funding. Major projects are summarized here.

Region-wide/Central Office Accomplishments

Green Infrastructure for Stormwater Treatment and Control Handbook

Objective: Implement a region-wide Green Infrastructure education effort.

Description: MassBays was fortunate to receive technical assistance through EPA's contract with Tetrattech last year. With a scope of work developed in conjunction with EPA NEP staff at Headquarters, MassBays worked closely with Tetrattech to generate multiple products oriented toward informing municipal staff and officials about the benefits of green infrastructure for stormwater treatment and control. While Criticaled on Massachusetts, the Handbook provides coast-oriented guidance for assessing need and implementing green infrastructure approaches by municipalities, including consideration of climate change impacts on those installations.

Partners: While Tetrattech provided the engineering expertise critical to the project, MassBays contributed significant assistance to develop the handbook outline, devise a workshop agenda, and edit the final handbook. EPA Headquarters staff provided critical contract management to keep the project on time. MassBays Regional Coordinators secured space, recruited attendees, and provided local context for the more generalized presentations.

Deliverables:

1. Train-the-Trainer workshop, which provided critical input to the final Handbook and regional workshops.
2. Final handbook, available on EPA's website (http://water.epa.gov/type/oceb/nep/upload/MassBays_Handbook_combined_508-opt.pdf) and MassBays' website (<http://www.mass.gov/eea/docs/mbp/publications/massbays-green-infrastructure-handbook.pdf>).
3. Fact sheet describing the handbook, to be used as a handout in multiple settings.
4. Four regional training sessions; more than 147 people representing 79 communities attended the workshops and provided written evaluations.

MassBays §320 funds: \$20,000

Long-term Outcomes: New expertise among municipal employees, improved coastal water quality.

CWA core program: (4) addressing diffuse, nonpoint sources of pollution

Online Resource Inventory

Objective: providing online access to planning and assessment documents generated about MassBays embayments.

Description: In 2013, MassBays conducted a literature review of papers, presentations, reports, and other relevant material produced from 1996 (the last CCMP) to present, to inform the CCMP revision. The review Criticaled on five priority topics (water quality, invasive species, climate change/vulnerability, continuity of estuarine habitat, and estuarine habitat protection) in the EDA. This year, MassBays provided broad access to the documents via an Online Resource Inventory on our website. The web page compiles 539 resources identified through that effort into a Google-based interactive map. Upon selecting an embayment, the user is invited to view a spreadsheet of references categorized by topic, embayment, author, and date, each linked to a document for download and detailed review. This is the first time many of these documents have been made available electronically.

Lead/Partners: MassBays' Staff Scientist was the lead on the project. A graduate student from Clark University formatted the materials and prepared all files for uploading. CZM provided significant GIS mapping support.

Deliverables: An online, clickable map of the 47 MassBays embayments (<http://www.mass.gov/eea/agencies/mass-bays-program/publications/>).

Budget: \$5000 (\$320 funded salaries, fringe, and indirect), 200h summer intern, 30h GIS support

Long-term Outcomes: New insights into past assessments and recognized gaps; better-informed planning and decisionmaking at the local level.

CWA core program: (6) protecting coastal waters through the National Estuary Program

Estuary Delineation and Assessment Viewer

Objective: A major success in 2012 was completion of an Estuary Delineation and Assessment (EDA) for MassBays, which identified 47 distinct embayments in the region. As the information compiled in this report will serve as the foundation for future resource planning, it is important that the information is made accessible to partners and stakeholders.

Description: In 2015, in conjunction with the State of the Bays Symposium, MassBays launched an EDA Viewer that allows visitors to visualize the data from the report for their own purposes. Once downloaded from our website, these multi-layered pdf files reveal stressors and resources, pinpointed within the embayment boundary. Each layer can be turned off or on according to the users' need.

Lead/Partners: MassBays' Staff Scientist was the lead on the project. CZM provided significant GIS mapping support.

Deliverables : A new online resource consisting of 47 maps (<http://www.mass.gov/eea/agencies/mass-bays-program/estuaries/>).

Budget: \$7000 (\$320 funded salaries, fringe, and indirect), 60h GIS support

Long-term Outcomes: effective communication with stakeholders about cross-embayment planning; constructive feedback from decisionmakers about data needs.

CWA core program: (6) protecting coastal waters through the National Estuary Program

State of the Bays Symposium

Objective: An opportunity for partners to share information and learn from each other about status and trends in the Bays; announce availability of MassBays' draft CCMP for public review.

Description: Symposium was a one-day event held in downtown Boston (accessible via public transit), on Wednesday April 15th. The agenda included 3 keynote presentations and 19 panelists taking part in 5 panels moderated by MassBays Management Committee members. Several posters describing MassBays-funded programs were displayed in the meeting space, on the 17th floor of a new business incubator. A graphic recorder documented all aspects of the event on large boards, which served as platforms for small-group discussion and a transition to a presentation about MassBays' draft CCMP.

Partners: MassBays Central Staff led this project; contributions from The Nature Conservancy paid for refreshments; the Marine & Oceanographic Technology Network enabled us to provide

free attendance to graduate students and citizen volunteers; dpict, inc. provided discounted graphic facilitation, and the Association to Preserve Cape Cod processed registrations.

Deliverables and Milestones: Attendee packets included an agenda for the event, speaker bios, a MassBays fact sheet, an executive summary of the Public Review Draft CCMP, and a list of posters. All RCs presented case studies illustrating MassBays' contributions to the state of the Bays (see Publications, below). Critical context and support for the effort was provided by four plenary speakers, including Region 1 Deputy Administrator Deborah Szaro. Forty-four of the 100 attendees provided feedback via a written/online evaluation form; more than half of respondents recommended holding the Symposium more frequently (the previous event was held in 2008). Graphic recordings and proceedings are on our website (<http://www.mass.gov/eea/agencies/mass-bays-program/state-of-the-bays/>). Transferable tools include the use of graphic recording to spark discussion and facilitate new insights, and the speed-talk format of the panel sessions; Narragansett Bay NEP has already contacted us for information about planning and budgeting.

\$320 funds: \$20,000 (salaries & fringe), \$1500 (supplies)

Long-term Outcomes: More frequent State of the Bays reporting, tested format for future events, new collaborations among attendees.

CWA core program: (6) protecting coastal waters through the National Estuary Program

Research and Planning Grant Program: Completed Projects

Environmental Impacts of Docks and Piers on Salt Marsh Vegetation Across Massachusetts Estuaries – A Quantitative Field Survey Approach

Objective: To evaluate the impacts of small docks and piers on salt marsh vegetation in Massachusetts.

Description: Proliferation of small docks and piers in salt marsh habitats poses potential cumulative impacts on this ecosystem through shading and displacement of marsh vegetation. In 2013 with funds from the MassBays Research and Planning Grant Program, a study was initiated to provide information on dock shading effects and test existing guidelines. Preliminary results provide cautious support for the current guidelines and further monitoring was recommended for more rigorous testing (2 more years). Building on this effort, in 2014, the Massachusetts Division of Marine Fisheries (*Marine Fisheries*) conducted a field study examining shading impacts of small docks and piers on salt marsh vegetation. From July to September, marsh vegetation samples were collected from 211 docks in 15 towns across the state. Samples were collected under docks and at adjacent, unshaded control sites. Dock characteristics were also measured for comparison with vegetation results. Together with the ongoing dock matrix study conducted in the Town of Marshfield in 2013 results will be used to assess the effectiveness of existing regulations and serve to inform potential revisions to refine construction standards.

Lead/Partners: MA Division of Marine Fisheries was the lead on this project; with \$320 funding they were able to hire summer interns to conduct this investigation

Deliverables: Among all dock stations, dock sites had lower stem density and biomass than unshaded areas, with median values of 37.8% (stem density) and 58.5% (stem biomass) of unshaded areas. Dock height was the most important design characteristic influencing relative shading impacts, and docks set \geq five feet above the marsh platform had the highest overall stem density and biomass. Height to width ratio also influenced relative shading impacts, and docks that

met or exceeded recommended 1:1 height to width guidelines had greater stem density and biomass than docks set with a lower ratio. Docks with grated decking had significantly greater stem biomass but not stem density relative to docks with traditional decking.

\$320 funds: \$15,500

Long-term Outcomes: Permitting for docks and piers that is known to minimize shading impacts on salt marsh habitat.

CWA core program: (5) protecting wetlands

Site Reconnaissance, Survey and Development of Conceptual Design Option for Fish Passage Restoration, Upper Herring River Watershed, Wellfleet

Objectives: To evaluate impediments to upstream and downstream movement of anadromous alewife (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*) and catadromous American eel (*Anguilla rostrata*) posed by existing stream crossings, and to assess potential sources of erosion in the same vicinity.

Description: Over the last several years, the Herring River Restoration Project has been striving to restore more than 1,000 acres of degraded estuarine habitat from various alterations to the river's natural hydrology during the last century. Rigorous hydrologic modeling and ecological analyses showed that this will restore tidal hydrology and salinity to the majority of the historic estuary, greatly improving wildlife habitat conditions and fish access in the lower estuary. However, the project did not address impaired fish passage in the upper watershed and populations have declined drastically. This project involved preliminary evaluation of two existing undersized culverts, and recommendations for replacement culvert design to meet criteria described in the Massachusetts River and Stream Crossing Standards to improve passage of river herring, American eel and other fish. Six alternatives were evaluated for the stream crossing at one location, and five alternatives were evaluated for the stream crossing at the second location. Based on the observed conditions at the two project sites, a critical need for wildlife passage through the two project stream crossings was not identified at the two sites. The conceptual designs were developed to accommodate site-specific conditions and existing use while providing for improved passage of aquatic fauna.

Partners: Friends of Herring River

Deliverables: Conceptual designs for preferred alternatives and erosion control practices for the site.

\$320 funds: \$20,000

Long-term Outcomes: Re-population of the Herring River waterways with herring species.

Integrating New Technologies into a Cost-effective, Community-based Method for Monitoring Salt Marshes in a Changing Climate

Objective: To assess long-term (more than 10-year) changes and trends in local salt marsh systems

Description: Following intensive storm episodes over the last few years, increased erosion, subsidence and overall deterioration of the salt marsh along the Jones River and Kingston Bay have been observed. A need to assess the causes and rates of erosion and identify potential and remediation activities that may be implemented was identified. With funding from the MassBays Research and Planning Grant Program Jones River Watershed association partnered with MIT Sea Grant, UMass Boston, and the North and South Rivers Watershed Association to monitor

geological, biological, and chemical conditions in local salt marshes using a combination of remote sensing and traditional on-the-ground techniques. In particular the team will Critical on issues such as sea level rise, regional salt marsh dieback and invasive species. Building on work previously conducted in the North and South Rivers, the team assessed long-term changes in salt marsh systems in the North River and South River as well as started to collect similar data in the Jones River. Overall the marshes were found to be in generally good health. No major die-back events, no extensive salt pannes, limited invasive species, robust plant density and growth, were observed. While there were changes observed from 2001 to 2014 there were neither significant loss of marsh nor major transitions to degraded marsh surfaces. In the Jones River plant communities were typical of healthy salt marshes. The comparison of 2001 vs 2014 measurements in the North and South Rivers does suggest changes indicative of increased inundation. The interannual variability data for the region showed that the past 5 years have been period of higher than average sea levels, as part of a long-term oscillation. Recommendations for longer-term monitoring were made to have data on trends and chances in the salt marsh.

Lead/Partners: Jones River Watershed Association and MassBays South Shore Regional Coordinator

Deliverables: Final report with description of findings and conclusions that will indicate to managers the usefulness of long-term monitoring in salt marshes especially in conjunction with sea level rise and erosion impacts.

\$320 funds: \$19,480

Long-term Outcomes: Improved understanding of coastal processes taking place in salt marshes, to support development and implementation of policies/projects to address habitat degradation, and promote salt marsh migration and restoration efforts.

CWA core program: (5) protecting wetlands

Building a Resilient Eelgrass Population in the Waters of the Great Marsh ACEC

Objective: To expand eelgrass habitat in Essex Bay, and examine population structure of European green crabs, observed to have a significant impact on eelgrass beds in the area.

Description: Test-transplanting in 2013 resulted in low success rates attributed to a variety of stressors leading to recommendations to continue the efforts for a second year in the southern part of the Sound and to expand into Essex Bay where a new self-established bed, the first in the ACEC in over 75 years, has been identified. This project involved coordination with local fishermen to address the impacts of a hyper-abundant green crab population in the area that may jeopardize restoration initiatives. Eelgrass successfully transplanted into multiple sites in Essex Bay while transplants failed in Plum Island Sound. Green crab populations were found to be hyper-abundant throughout the Great Marsh system. Based on findings, it was recommended to conduct a large-scale restoration at select sites in Essex Bay using multiple donor sources. Additionally baseline information on the population structure of the green crab should continue to be collected in both Plum Island Sound and Essex Bay and used to implement a depletion program for this invasive species before it thwarts our efforts to restore and enhance the overall resiliency of this system.

Lead/Partners: Town of Essex, MassBays Upper North Shore Regional Coordinator

Deliverables: Eelgrass successfully transplanted into multiple sites in Essex Bay while transplants failed in Plum Island Sound. Green crab populations were found to be hyper-abundant throughout the Great Marsh system. Based on our results, it was recommended to conduct a large-scale restoration at select sites in Essex Bay using multiple donor sources while continuing test-transplanting efforts in Plum Island Sound. All transplant sites were monitored and managed for green crabs.

\$320 funds: \$20,000

Long-term Outcomes: Re-established eelgrass supports increased ecosystem productivity; management of green crabs incorporates scientific information about population dynamics.

King Tide Photo Contest and Outreach

Objective: To conduct a Gulf of Maine regional photo contest documenting the fall 2014 King Tide and use the contest as a vehicle to educate about potential increases in sea levels.

Description: The Metro Boston regional coordinator worked with other partners from 3 states and 2 Canadian provinces across the Gulf of Maine to develop the photo contest, pre and post press, twitter feed content, King Tide website, and educational materials.

Partners: Gulf of Maine Council, NH Sea Grant/UNH Cooperative Extension, Casco Bay Estuary Partnership, Ecology Action Centre, Wells National Estuarine Research Reserve, Great Bay National Estuarine Research Reserve, St. Croix Estuary Partnership

Deliverables: Nova Scotia to Massachusetts photo contest with 200 photo entries, press, website (<http://gulfofmaine.kingtides.net>), tweets, printed photos and educational materials for conferences etc.

Long-term Outcomes: Improved understanding of potential sea level rise impacts to local and recognizable areas by depicting future new tidal norms

CWA core program: (6) protecting coastal waters through the National Estuary Program

C. Regional Major Completed Projects

The Major Completed Projects described below are transferable, model efforts from across the MassBays region. Additional completed projects are listed by region below these highlighted success stories. Note that Section 320 funds were applied to RC salaries to complete the projects; four Regional Service Providers (all except Metro Boston) received \$61,000 in \$320 funds over the course of the fiscal year to complete programs listed here and under “other completed projects,” listed following.

Merrimack River Geographic Response Plan

Objective: To develop a Geographic Response Plan (GRP) for the Merrimack River.

Description: The Upper North Shore RC worked with EPA and its consultant to develop map-based plans tailored to protect specific sensitive environmental areas from oil spill impacts, locating sensitive areas for first responders and placement of oil spill protection resources to protect those areas.

Partners: Merrimack River municipalities, DEP, EPA, Merrimack River Watershed Council, Nuka Research and Planning Group (contractor), and other riverine stakeholders

Deliverables: Five individual GRPs for strategically chosen regions along the river.

Long-term Outcomes: Oil-spill related impacts on natural resources minimized and prevented

CWA core program: (4) addressing diffuse, nonpoint sources of pollution

Regional Conferences

Objective: Facilitate networking and learning within MassBays sub-regions.

Description: Each MassBays RC worked closely with partners to plan and implement conferences relevant to MassBays goals and intended outcomes. Brief descriptions follow:

- *Sea Level Rise Adaptation Workshop* (Upper North Shore): Third annual event to educate area stakeholders and inform Great Marsh community officials and volunteer board members on the local threat from sea level rise and potential mitigation measures. This year's theme was resilience of natural systems and resiliency planning and green infrastructure, marsh migration modeling, and local adaptation case studies.
(<http://www.greatmarsh.org/component/content/article/79-news-and-events/118-great-marsh-symposium-2014>, presentations available under "Resources" tab)
- *TMDL for Pathogens Workshop* (Lower North Shore): An informational workshop on the Pathogen TMDL for the North Coastal Watershed. Representatives from MA DEP and EPA provided an overview of the existing TMDL and its application, including implications for MS4 permitting. Options for implementation and local initiatives that have led to reduced bacteria loadings in receiving waters were presented.
(<http://www.salemsound.org/TMDL.html>)
- *The Future of Water in Southeastern Massachusetts conference* (South Shore): A day-long conference on the grounds of Plimoth Plantation for local stakeholders and citizen-activists, including panel presentations re: "Fundraising for Water," "Science and Data Collection," "Outreach," "Stormwater," "Drinking Water," "Wastewater," "Recreational Waters," and a plenary talk by Eric J. Walberg, Senior Program Leader for Climate Services at Manomet Center for Conservation Sciences, "Watershed Management in a Warming World."
(<http://watershedaction.org/index.php/2015-conference/conference-summary>)
- *Cape Cod Coastal Conference:* A two-day conference titled "State of the Cape: Implementing Strategies To Improve Water Quality & Build Coastal Resilience."
(<http://www.waquoitbayreserve.org/education-training/coastal-training-programs/2014-cape-coastal-conference-2/>)

Partners: MVPC, APCC, NSRWA, SSCW, USGS, regional planning agencies, LGCs, The Nature Conservancy, MassAudubon, CZM, Boston University, Marine Biological Laboratory- WHOI, University of New Hampshire, Parker River National Wildlife Refuge, National Wildlife Federation, Northeastern University, DER. North Shore town and municipal staff, nonprofits such as Safer Waters in Massachusetts, Ipswich River Watershed Association, Southeastern MA Watershed Action Alliance, Waquoit Bay National Estuarine Research Reserve, Division of Ecological Restoration, DEP, EPA

Deliverables: Agendas; event websites as noted in description

Long-term Outcomes: Actions and outcomes specific to topic area, more cohesive approach within each region, increased awareness of MassBays' role in the regions.

CWA core program: (6) protecting coastal waters through the National Estuary Program

Cape Cod Draft Restoration Prioritization Plan

Objective: support progress on and generate grant support for habitat restoration on Cape Cod.

Description: Cape Cod RC led and documented a comprehensive project to identify, evaluate and prioritize salt marsh and fish run restoration projects and stormwater mitigation projects. The goal was to provide recommendations for updating the Cape Cod Water Resources Restoration Project (CCWRRP). Activities included meetings with partners to identify projects, conducting site visits, developing project descriptions, collecting lessons learned from partners regarding the first round of completed projects, developing recommendations for improving the project and for project selection criteria. Next steps: working with partners to finalize project selection criteria, developing new criteria for new categories of projects that address water quality TMDLs and coastal ecosystem resilience, ranking and prioritizing projects, updating the CCWRRP plan with recommendations for improvements, developing a plan for a Cape-wide restoration coordination center, grant-writing and outreach to promote funding and restoration.

Partners: APCC, municipal representatives to the Barnstable County Coastal Resources Commission on Cape Cod, DER, DMF.

Deliverables: Restoration prioritization matrix (draft delivered), outreach and communications materials regarding outcomes, model approach and product for other regions. Inventory of restoration projects (stormwater, salt marshes, fish runs) (draft delivered), draft lessons learned and recommendations for improving the Cape Cod Water Resources Restoration Project.

Long-term Outcomes: Restoration of high-priority habitat areas

Estuarine species monitoring, 2014 - Spring 2015

Objective: submit data to resource managers, outreach to multiple stakeholders

Description: RCs trained, organized, and assisted volunteers in collecting data for state-wide resource management, including:

- Lower North Shore (8 sites), Upper North Shore (7 sites), and South Shore (7 sites) monitoring for non-native species.
- South Shore horseshoe crab spawning surveys and tagging in Duxbury Bay
- South Shore and Cape Cod herring run monitoring, in coordination with the River Herring Warden Network.

Deliverables: Data submitted to CZM (marine invasives) and DMF (river herring, horseshoe crabs), outreach materials (e.g., newspaper articles, newsletters) provided to the public.

Long-term Outcomes: Data-informed management of target species, the public supports protection and restoration of estuarine species and their habitat.

Third Herring Brook Restoration (Hanover and Norwell)

Objective: To restore flow in Third Herring Brook

Description: NSRWA worked with partners to facilitate the removal of the Mill Pond Dam and final design and permitting of the removal of the Tack Factory Pond Dam, and provide community education on the project.

Partners: municipalities, DER, South Shore YMCA, Cardinal Cushing Centers, NOAA

Deliverables: Newsletter article and video documentation of Mill Pond Dam removal and stream restoration, *Galerucella* ranching for purple loosestrife control in the drained impoundment area, proposal submitted to fund removal of Tack Factory Dam

Long-term Outcomes: Improved water quality and quantity in Third Herring Brook to support natural systems.

Climate change resilience – municipal program support

Objective: To aid municipalities in taking advantage of state capital investment.

Description: In 2014-2015, the Office of Coastal Zone Management offered more than \$2 million to Massachusetts coastal communities to support progress on responses to climate change impacts, both current and future. MassBays RCs played roles in developing proposals for funding, providing in-kind match, and implementation.

Partners: municipalities, CZM

Deliverables: Projects funded in MassBays with RC support include:

Project Name and Town	MassBays region	Description of RC Involvement
Downtown Improvement Phase II - Stormwater Management, Manchester by the Sea	Lower North Shore	Evaluate opportunities for stormwater LID BMP retrofits in the Downtown.
Jones River Estuary BMP Design and Implementation - Phase III, Kingston	South Shore	Wrote support letter, helped promote results to other state organizations (i.e. MA Division of Marine Fisheries)
Bay Road BMP Construction - Phase III, Duxbury	South Shore	Wrote support letter, helped promote results to other state organizations (i.e. MA Division of Marine Fisheries))
Coastal Processes Study and Resiliency Recommendations for Duxbury Beach and Bay, Duxbury	South Shore	Wrote support letter
Project Name and Town	MassBays region	Description of RC Involvement
Sawmill Brook Culvert and Green Infrastructure Analysis, Manchester by the Sea	Lower North Shore	Evaluate capacity of bridges and culverts in Sawmill Brook watershed under future precipitation and sea level rise conditions. Engage volunteers in field activities
Increasing Coastal Resiliency and Reducing Infrastructure Vulnerability by Mapping Inundation Pathways, Provincetown	Cape Cod	Provided letter of support; this project complements FY14 grant to Provincetown where APCC provided support.
Cobble Nourishment of Washover Areas at Plymouth Long Beach, Plymouth	South Shore	Wrote support letter, involved with promoting project to region via potential field trip
Winter Island Improvements, Salem	Lower North Shore	Create Winter Island Scenic Trail, including new signage, improved stormwater runoff, and added greenery.
North Scituate Beach Nourishment, Scituate	South Shore	Wrote support letter

Long-term Outcomes: Increased capacity among coastal communities to respond to climate change in habitat-friendly ways; successful case studies to promote future action.

Other completed projects

Upper North Shore

- Pepperweed mapping in the Great Marsh
- Phragmites mapping in Salisbury
- Green crab marketing group established
- Four workshops for North Shore Stormwater Collaborative hosted

Lower North Shore

- Salem Harbor turbidity study conducted
- Salem Harbor water temperature study conducted
- Stormwater education materials provided to municipalities for distribution
- Pepperweed mapping in Salem Sound
- City of Salem Climate Adaptation Planning and Outreach
- Rosies Pond Neighborhood Coastal Resiliency Project
- Coastal Bank Erosion project at two salt marshes in Salem

South Shore

- Post-restoration monitoring at Tidmarsh Farms
- Herring Brook flow study to inform municipal water management
- Proposal for funding to remove Tack Factory Dam
- Pilot project for blue mussel re-establishment

Cape Cod

- Draft inventory of fishway restoration projects
- Draft inventory of stormwater projects for shellfish habitat restoration
- Draft inventory of tidally restricted wetlands for salt marsh restoration
- Compiled list of existing QAPPs for citizen monitoring efforts, to promote standard protocols
- Workshop and video on joint project with USGS, Cape Cod Commission and The Nature Conservancy regarding sea level rise impact on Cape groundwater and water resources
- Documentation of coastal erosion and natural communities at Brewster town landings
- Recommendations for monitoring shellfish aquaculture and shellfish bed restoration used as nitrogen mitigation measures, for 208 Water Quality Plan for Cape Cod
- Recommendations for selection criteria for pilot projects for 208 Water Quality Plan for Cape Cod

Publications and Presentations

Massachusetts Bays National Estuary Program e-Newsletter, published August 2014, November 2014, February 2015, and May 2015.

Massachusetts Bays National Estuary Program Management Committee e-Newsletter, published August 2014, September 2014, November 2014, March 2015.

State of the Bays Report: Proceedings of the 2015 MassBays State of the Bays Symposium

Green Infrastructure for Stormwater Treatment and Control, A Handbook for Municipal Officials

"No More Dirty Water: Green Infrastructure for Stormwater Treatment and Control" February 28, 2015. Mass. Association of Conservation Commissioners Annual Meeting, Worcester, MA.

Fact Sheet: Green Infrastructure for Stormwater Treatment and Control Handbook

Posters presented at the State of the Bays Symposium, April 15, 2015:

Determining the Nature and Causes of Turbidity Events in Salem Harbor

J. Bradford Hubeny, Jeremy N. Louisos, Barbara Warren
Salem State University, Salem Sound Coastwatch

Restoring Eelgrass to the Great Marsh: A Three-Year Study

Alyssa Novak, Peter Phippen, Fred Short
Boston University, Center for Coastal Studies, MassBays, University of New Hampshire

New tools and information from MassBays (Estuary Delineation and Assessment, Resource Inventory online; Tide Gate Inventory project)

Prassede Vella, Lisa Engler
MassBays

Metro Boston

“MassBays goings-on: Stormwater Green Infrastructure Project, Resource Inventory web tool, Tide Gate Inventory and Assessment Project and Programmatic Planning” Boston Harbor Habitat Coalition meeting, December 10, 2014.

“Conservation mooring as a tool to minimize boating impacts to eelgrass: Observation from Massachusetts” November 4, 2014. Restore America’s Estuaries 7th National Summit. National Harbor, MD.

Upper North Shore

Rattigan, D. 2014. “Educational tour features smartphone application” *The Boston Globe* July 3.
<http://www.bostonglobe.com/metro/regionals/north/2014/07/02/learn-you-great-marsh-tour/7D9Bq2p2tHf7ykQmoCnBqO/story.html>

Rattigan, D. 2014. “\$2.9m in US aid brightens future of Great Marsh” *The Boston Globe* July 3.
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<http://www.newburyportnews.com/local/x1927871056>

Chiaromida, A. 2014. “‘King tide’ seen as test for rising seas.” *Gloucester Daily Times* October 3.
http://m.gloucesterimes.com/news/local_news/king-tide-seen-as-test-for-rising-seas/article_27fd16d8-23ad-5736-9be7-95e13ea8a3fb.html?mode=jqm

Mac Alpine, D. 2014. “Trapping confirms green crab fears in Great Marsh.” *Wicked Local Gloucester* July 19. <http://gloucester.wickedlocal.com/article/20140719/News/140716143>

Rattigan, D. 2014. “Teens help aquarium remove invasive species.” *The Boston Globe*, July 13.
<http://www.bostonglobe.com/metro/regionals/north/2014/07/12/students-study-invasive-crab-species/cAP3xHaYaTaugCfof3FIGK/story.html>

“Community Risk Reduction through Comprehensive Coastal Resiliency Enhancement for the Great Marsh Ecosystem, Upper North Shore Massachusetts” June 3, 2015, presentation for the New England Wetland Scientists Annual Meeting

“State of the Bays Symposium, Phragmites Management in the Great Marsh”, April 15, 2015, presentation for the MassBays Program, State of the Bays Symposium

“Creating the Basis for A Successful Eelgrass Restoration in the Great Marsh”, November 2014, presentation for MA Division of Marine Fisheries

“Great Marsh History, Ecology, Environment, Threats”, August 2014, presentation to the Annisquam Yacht Club, Gloucester MA, for the Great Marsh Coalition

“Areas Vulnerable to Storm Surges and Sea Level Rise on Cape Ann”, July 2014, Eight Towns and the Great Marsh Committee meeting

“Community Risk Reduction through Comprehensive Community Resiliency Enhancement for the Great Marsh Ecosystem”, October, 2014, presentation to Storm Surge speaker series; September 2014, Great Marsh Legislative Delegation; August 2014, Merrimack River Beach Alliance

“Great Marsh Hydrodynamic Modeling Options”, January 2015, Hurricane Sandy Modeling Oversight Committee

Lower North Shore

“The North River Natural History as Public History” August 2014. Peabody Higgins Middle School. (presentation)

“Sea Level Rise on Cape Ann – Taking Action Locally” September 2014. Gloucester MA (presentation)

“Trails and Sails – Beach Seining Demonstration” September 2014. Salem MA

“Swampscott's Introduction to MassBays and Salem Sound Coastwatch” November 2014. Swampscott MA. (presentation)

Hosted 2015 Underwater in Salem Sound Lecture Series: "Rock, Gravel, Sand - The Geology of Our Local Beaches" Dr. Lindley Hansen; "On the Rocks - Life Underwater" T. Maney; "Horseshoe Crabs - The Ancient Blue Bloods" Dr. Sara Grady

“Local Case Studies for the Reduction of Bacteria” January 2015. North Coastal TMDL for Pathogens, Danvers MA. (presentation)

“Sawmill Brook Watershed Forum” April 2015. Manchester-by-the-Sea MA.

“Water Quality Case Studies of Success on the North Shore and Lessons Learned” Massachusetts Bays National Estuary Program State of the Bays Symposium. April 2015. Boston MA.

“Peabody GreenFest” May 2015. Peabody MA.

“Listening to the Neighborhood while Taking a Look at Future Climate Impacts for Salem and the South River” April 2016. Flooding in Salem’s South River Watershed. Salem MA. (presentation)

“Engineering Solutions to the Flooding from Rosies Pond & Jefferson Avenue” April 2016. Flooding in Salem’s South River Watershed. Salem MA. (presentation)

“Will Your Home Flood in the Next Superstorm?” May 2015. Historic Derby Street Neighborhood Association Salem MA. (presentation)

“Slow the Flow – Rosies Pond: Soak Up and Capture the Rain” May 2015. Salem MA. (presentation)

“Adopt a Beach Training: Beaches 101” April in Beverly Farms MA; May 2015 in Marblehead MA.

“Marine Invasive Species: up close and personal” June 2015. Winter Island, Salem MA.

South Shore

Mand, F. 2014. "Plymouth Harbor to open for shellfishing for the first time in over 40 years." *The Patriot Ledger*, September 23.
<http://www.patriotledger.com/article/20140923/NEWS/309249989>

Owens, L. 2015. "Volunteers help horseshoe crabs flourish along the South Shore." *The Patriot Ledger*, May 27. <http://www.patriotledger.com/article/20150527/NEWS/150527119>

Laidler, J. 2014. "After 40 years, shellfishing to resume in Plymouth harbor" *The Boston Globe*, October 2.
<http://www.bostonglobe.com/metro/regionals/south/2014/10/01/shellfishing-plymouth-inner-harbor-return-after-more-than-four-decades/dRL15fHaUxpcxhH5UZA04J/story.html>

Tiernan, E. 2014. "Dam removal in Hanover will restore watershed habitat." *The Patriot Ledger*, October 10. <http://www.patriotledger.com/article/20141010/News/141019655>

"Monitoring Salt Marshes in a Changing Climate" May 19, 2015. NSRWA Board Meeting, Norwell, MA.

"Wildlife - Shellfish Openings on the South Shore" April 15, 2015. MassBays State of the Bays Symposium, Boston, MA.

"Jones, North, and South Rivers Salt Marsh Assessment" January 2015. Authors: Alex Mansfield, Jones River Watershed Association; Dr. Sara Grady, MassBays South Shore and NSRWA.

"Population Ecology and Management" January 21, 2015. Gates Middle School, Scituate, MA.

"Watersheds and Water Quality" December 5, 2014. Notre Dame Academy, Hingham, MA.

"Massachusetts Bays Program Green Infrastructure Handbook - Workshop Teaser" October 23, 2014. South Shore Conservation Commission Network Meeting, Norwell, MA.

"Vegetation Community Monitoring Report - Off Billington Street Dam Removal" October 2014. Authors: Nick Wildman, Mass. Division of Ecological Restoration; Dr. Sara Grady, MassBays South Shore and NSRWA.

Cape Cod

"Evaluating the effects of sea level rise on Massachusetts coastal aquifers: a Cape Cod pilot study". Presentation at MassBays State of the Bays Symposium, April 15, 2015.

Presentation at CRC meeting, 4/30/15: update of CCWRRP, draft list of restoration projects (stormwater discharges, salt marshes, fish runs), lessons learned and recommendations.

Presentations at herring count volunteer training meetings in Eastham, Dennis, and Yarmouth.

APCC newsletter, Summer 2014: articles on "APCC helps to line up priority restoration projects", "Helping communities to build coastal resiliency", and "APCC wins MassBays contract".

APCC newsletter, Winter 2014: articles on "Workshop: handbook features green infrastructure approaches for stormwater", "APCC comments on proposed state Ocean Management Plan".

APCC newsletter, Spring 2015: articles on "Coastal resiliency project examines role of natural communities", "River herring counts are underway", and "Update on priority restoration projects for Cape Cod".

Draft Monitoring Report on Assessment and Monitoring of Natural Systems (Beaches and Natural Communities) for Town of Brewster project “Building Coastal Resilience in Brewster”. January 6, 2015.

Monitoring recommendations for shellfish aquaculture and shellfish bed restoration, prepared for Cape Cod CWA 208 Monitoring Subcommittee

Recommendations for criteria for pilot projects, prepared for §208 Monitoring Subcommittee

Recommendations for monitoring protocols, prepared for §208 Monitoring Subcommittee and APCC Environmental Summit 2015

Produced outreach video “Saving Paradise: Video 3: Sea Level Rise – Changing Cape Cod’s Groundwater” Posted at: <http://www.apcc.org/videos/index.html>

Travel expenditures, July 1, 2013 - June 30, 2014

MassBays Central Staff submitted the following travel expense reimbursements for FFY2014:

Date(s) of Travel	Person Traveling	Location	Purpose of Travel	Amount (travel, per diem, registration)
7/29/2014	Executive Director (ED), Staff Scientist	Worcester MA	meeting with DEP §319 and NPS staff	\$ 40.80
7/30/2014	Outreach Coordinator/ Metro Boston RC	Norwood MA	Neponset River regional stormwater committee	\$ 20.70
10/28/2014	ED	Barnstable MA	green infrastructure for sw workshop	\$ 91.35
10/29/2014	ED	Pembroke MA	green infrastructure for sw workshop	\$ 42.75
9/17/2014	ED, Outreach Coordinator/ Metro Boston RC	Boston Harbor Islands	beach cleanup	\$ 30.00
11/3 - 11/5/2014	Outreach Coordinator/ Metro Boston RC	Washington DC	RAE National Conference	\$ 607.47
11/2 - 11/3/2014	ED	Washington DC	ANEP National Meeting	\$ 144.55
11/7/2014	ED, Outreach Coordinator/ Metro Boston RC	Woods Hole MA	New England Ocean Literacy Summit	\$ 68.40
Date(s) of Travel	Person Traveling	Location	Purpose of Travel	Amount (travel, per diem, registration)
11/13/2014	ED, Outreach Coordinator	Essex MA	Great Marsh Symposium	\$ 58.35
12/4/2014	ED, Staff Scientist	Portsmouth NH	Gulf of Maine meeting	\$ 46.80
1/22/2015	ED	Westborough MA	New England Ocean Science Education Collaborative meeting	\$ 36.85
2/22 - 2/26/2015	ED	Washington DC	ANEP/EPA Annual Meeting	\$ 1,567.21
4/17/2015	ED	Plymouth MA	Southeast Water Conference	\$ 250.00
			Total	\$ 3,005.23

C. New and Ongoing Projects

Critical Areas and Outcomes

MassBays' workplan for FFY2015 augments and expands ongoing efforts to mitigate and halt chronic impacts on the region's estuarine habitats posed by the following Critical Impact Areas:

- Contaminated and uncontrolled stormwater runoff
- Wastewater discharge
- Barriers to streamflow and tidal flushing
- Climate change
- Spread of invasive species

The proposed projects reference these impacts, and indicate anticipated outcomes for this fiscal year:

1. MassBays provides new resources for research and management in the Bays.
2. MassBays reaches all planning-area municipalities with actionable information about estuaries.
3. MassBays provides regular and locally informed State of the Bays reporting that reflects the unique characteristics and progress toward targets for planning area embayments.

Cross-cutting Projects

Comprehensive Conservation and Management Plan (Ongoing)

Objective: Revise MassBays' CCMP

Critical Impact Area: All

Description: MassBays' Executive Director will work closely with EPA Regional and Headquarters staff to ensure that the CCMP revision meets standards set out by pending guidance. This may require re-convening a Management Committee subcommittee and Local Governance Committees to ensure in turn that local priorities are still reflected in the final document.

Partners: MassBays Central Staff leads this effort. Partners include the Management Committee, and Regional Coordinators and Local Governance Committees.

Deliverables and Milestones: documents produced to date are included in our draft Revised CCMP, especially in the Appendices, available online (<http://www.mass.gov/eea/docs/mbp/publications/massbays-public-review-draft-ccmp-4-15-15.pdf>). The final deliverable will be a Revised CCMP submitted to EPA Headquarters for concurrence, to be provided by September 30, 2015, including the following attachments: draft Fiscal Plan, draft Communications Plan, and draft Monitoring Plan.

Budget: \$8000 (salaries and fringe, \$320 funds)

Long-term Outcomes: Clear direction for MassBays for the next 10 years; established niche for MassBays in the crowded Massachusetts political/organizational structure around coastal issues and initiatives.

CWA core program: (6) protecting coastal waters through the National Estuary Program

Inventory and Support Citizen Monitoring in Massachusetts Bay and Cape Cod Bay (New)

Objective: Assess the state of citizen monitoring within the region

Critical Impact Area: All

Description: Multiple organizations across the Bays are conducting monitoring of local resources, but the results and data are, in many cases, hidden away in filing cabinets. MassBays will lead an effort to inventory ongoing long-term monitoring, university-based data sets, and emerging efforts to document environmental conditions across the region. The results will inform action to improve citizen monitoring practices through training and other outreach, bring the information to researchers and interpret outcomes for decisionmakers, and inform future State of the Bays assessments.

Partners: NERACOOS, GOMC's Ecosystem Indicator Partnership, RSPs, Management Committee, watershed and community-based associations, research/academic institutions, state/municipal entities, schools/clubs

Deliverables and Milestones: Online inventory/map of citizen monitoring programs, layered with data gaps and sentinel monitoring needs identified by the NE Sentinel Monitoring Program.

Budget: §320 funds: \$8000 (salaries and fringe), \$120 (travel, meeting supplies)

Long-Term Outcomes: New structure and supports for citizen monitoring efforts, increase in valid data applicable to resource management questions.

CCMP Outcome: MassBays provides *new resources for research and management* in the Bays.

CWA core program: (6) protecting coastal waters through the National Estuary Program

Embayment assessment and restoration tool (New)

Objective: to develop a basis for setting restoration targets across the region.

Critical Impact Area: All

Description: Building on the Estuary Delineation and Assessment and methods developed by EPA's Narragansett Lab with the Gulf of Maine Council (GOMC) and others, MassBays will identify parameters useful for cross-region comparison of embayments, and develop a tool for setting restoration targets that represent significant improvement in local conditions. The tool and its implications will be shared with local stakeholders, including municipal decisionmakers, as well as state agencies with responsibility for restoration.

Partners: RCs, LGCs, Management Committee, state and local agency representatives, EPA, GOMC, consultant

Deliverables and Milestones: Matrix of embayment types (December 2015), target restoration conditions by type (March 2015), presentations to state agencies and local stakeholders.

Budget: §320 funds: \$9000 (salaries and fringe), \$21,000 (consultant)

Long-term Outcomes: measurable improvement in individual embayments' condition.

CCMP Outcomes: MassBays provides new resources for research and management in the Bays; MassBays reaches all planning-area municipalities with actionable information about estuaries; MassBays provides regular and locally informed State of the Bays reporting that reflects the unique characteristics and progress toward targets for planning area embayments.

CWA core program: (6) protecting coastal waters through the National Estuary Program

Tide gate inventory (Ongoing)

Objective: Improve salt marsh conditions up- and down-stream of poorly managed, mismanaged, and abandoned tide gates.

Critical Impact Areas: barriers to streamflow and tidal flushing, climate change

Description: Document all tide gates in Massachusetts Bay and Cape Cod Bay, develop and test a field-based assessment protocol supported by capacity for remote data entry, and establish a web-based monitoring and management tool that incorporates potential impacts of sea level rise.

Partners: MassBays and CZM; RSPs; Advisory group includes representatives from MA Division of Ecological Restoration, MA Department of Environmental Protection, USGS, EPA Region 1.

Deliverables and Milestones: List of advisors, contractor scope of work, database, and protocol to produce a map/inventory of tide gates have been delivered on time and within budget under NOAA grant. Remaining deliverables include: field training for MassBays, CZM, DER, and DEP staff; web-based map and reporting application; tide gate layer updated on the state coastal GIS tool; outreach materials for municipal managers; and program evaluation. The grant funds expire March, 2016.

Total budget: \$148,000 (\$309 funds), \$0 (\$320 funds)

Long-term Outcomes: Increase in active, informed tide gate management that takes into account surrounding natural resources, abutting development, and rising sea levels.

CCMP Outcomes: MassBays reaches all planning-area municipalities with actionable information about estuaries.

CWA core program: (5) protecting wetlands

National Coastal Condition Assessment 2015 (Ongoing)

Objective: Provide support to EPA Office of Research and Development by coordinating the 2015 National Coastal Condition Assessment for Massachusetts.

Critical Impact Areas: stormwater runoff, wastewater discharge

Description: Working closely with EPA, MassBays will oversee sampling collection at 52 stations in Massachusetts state waters for water quality, sediment, and fish tissue analysis by a consultant selected this past year. Data collected will not only be in line with and provide information for the NCCA program, but will also help frame monitoring efforts under our new CCMP.

Partners: Management Committee's Science and Technical Advisory Subcommittee, MA Division of Marine Fisheries, CR Environmental

Deliverables and Milestones: water, sediment, and fish tissue samples delivered to EPA for distribution to specific laboratories for analyses (June-September 2015)

Budget: \$2616 (\$320 funds), \$140,000 (\$106 funds), \$5000 (state in-kind match)

Long-term Outcomes: continuous monitoring of coastal conditions to inform both national and regional management decisions.

CCMP Outcomes: MassBays provides *regular and locally informed State of the Bays reporting* that reflects the unique characteristics and progress toward targets for planning area embayments.

CWA core program: (2) identifying polluted waters and developing plans to restore them

MassBays-wide monitoring program development (Ongoing)

Objective: Meet requirements of the 2012 MassBays Program Evaluation; provide consistent reporting regarding the state of the bays.

Critical Impact Areas: All

Description: MassBays will develop a bays-wide monitoring plan that links to both local and regional monitoring efforts. MassBays will continue to collaborate with the Northeast Sentinel Monitoring Program and will continue to assist in the development of the Northeast Sentinel Monitoring Plan as the document is finalized and prepared for publication and implementation, Northeast Coastal Acidification Network (MassBays is a partner in the regional effort to engage stakeholder in ocean acidification awareness), and Gulf of Maine NEPs to connect MassBays to the larger region. As a demonstration for nested subregion-scale monitoring, the Lower North Shore RC will work with MassBays' staff scientist and local and subregional partners to identify data gaps, determine monitoring parameters, and develop a 5-year Marine Monitoring Plan.

Deliverables and Milestones: MassBays and Lower North Shore monitoring plan drafted for review by advisors (December 2015); 5-year monitoring plans for MassBays and Lower North Shore with associated cost estimates and funding plans (March 2016).

Budget: \$6,000 (salaries and fringe, \$320 funds)

Long-term Outcomes: More-frequent, long-term water quality and fish tissue monitoring in MassBays, in the larger national and regional context.

CCMP Outcomes: MassBays reaches all planning-area municipalities with actionable information about estuaries; MassBays provides regular and locally informed State of the Bays reporting that reflects the unique characteristics and progress toward targets for planning area embayments.

CWA core program: (2) identifying polluted waters and developing plans to restore them

Grant program re-launch (Ongoing)

Objective: Revise existing Research and Planning Grant Program to align with new CCMP goals and outcomes.

Critical Impact Areas: All

Description: With input from an external advisory committee, MassBays Staff Scientist will finalize revision of MassBays' grant program and produce a program fact sheet. MassBays staff will subsequently solicit grant applications via an RFR and convene a separate review committee to distribute awards.

Partners: Advisors from: Narragansett Bay NEP, Saugus River Watershed Association (past grantee), EPA Region 1, MIT Sea Grant, MA Department of Environmental Protection

Budget: \$2000 (salary & fringe, \$320 funds)

Deliverables and Milestones: revised RFR and announcement by September 2015; list of successful applicants, project titles, and funding requests by December 2015.

Long-term Outcomes: progress on CCMP priorities and action plans

CCMP Outcomes: All

CWA core program: (6) protecting coastal waters through the National Estuary Program

Assessment of historic eelgrass extent, Blue Carbon, Green Eelgrass (Ongoing)

Objectives: Provide a reliable basis for statements about eelgrass habitat extent and loss; expand regional planning regarding Blue Carbon to include eelgrass restoration and protection, by documenting eelgrass carbon sequestration, educating decisionmakers, and prompting new investments in eelgrass protection.

Critical Impact Areas: climate change

Description: This Climate Ready Estuaries project brings together regional experts in eelgrass characterization, restoration, and protection to build a case for eelgrass as an important component of Blue Carbon efforts in Massachusetts. The project includes a literature review, *in-situ* carbon sequestration measures to fill in data gaps, using sea level rise predictions to estimate eelgrass meadow changes, and developing written education tools and hosting workshops and meetings to influence local and state-level decisionmaking. To assess the reliability of historic eelgrass maps (prepared by MA DEP staff beginning in 1951), we will support intensive ground-truthing of eelgrass presence/absence in Duxbury, Kingston, and Plymouth Bays.

Partners (roles): MassBays NEP (project management, education & outreach), MIT Sea Grant (field investigations, education & outreach), EPA Region 1 (field investigations, estimating potential for eelgrass restoration and loss), Massachusetts Office of Coastal Zone Management (CZM; localized sea level rise modeling, GIS mapping), Massachusetts Division of Marine Fisheries (DMF; field investigations, historic map ground-truthing), and Boston University (sample analysis). A graduate-level intern and professional facilitation and communications services will be secured via competitive solicitations.

Deliverables and Milestones: Updated and uniform maps of eelgrass beds in Duxbury, Kingston, and Plymouth Bays (Fall 2016) Literature review re: carbon sequestration rates in eelgrass (summer 2015); field studies (summer 2015) and sample analysis (fall 2015) for four eelgrass beds in Massachusetts Bay and Cape Cod Bay and a comparison site in Martha's Vineyard; estimates of potential eelgrass loss and upslope migration due to sea level rise (fall 2015); regional scientific workshop to share results of the literature review and field studies, and solicit advice re: cogent points to share with resource managers (winter 2016); communication and outreach materials, including professionally developed scientific posters and fact sheets, slide presentations and speaking points to be used by MassBays staff and partners, and standing banners describing the ecosystem values of eelgrass (winter 2016); three regional workshops for resource managers and local partners (spring 2016).

Total Budget: \$86,000 (\$43,000 \$320 funds)

Long-term Outcomes: mutual understanding among researchers and resource managers regarding the importance of including eelgrass in Massachusetts blue carbon programming; increased and new investment in eelgrass restoration and protection.

CCMP Outcomes: MassBays reaches all planning-area municipalities with actionable information about estuaries.

CWA core program: (6) protecting coastal waters through the National Estuary Program

Target species and habitat monitoring and assessment (New and Ongoing)

Objective: support long-term monitoring of critical species and habitats in MassBays

Critical Impact Areas: All

Description: All RCs will take up sub-region-specific monitoring and assessment efforts to support CCMP goals and outcomes. Programs include:

- Metro Boston RC will assess and update the Boston Harbor Habitat Atlas and associated resources, including assessing the current online platform. (Ongoing)
- South Shore RC will lead mapping to assess eelgrass trends in Plymouth, Duxbury, and Kingston Bays from 1951 to present, using historical aerial photographs at a finer scale and use a consistent methodology over all time periods and start to elucidate potential causative factors for eelgrass losses noted in recent years. (New)
- South Shore RC will conduct horseshoe crab spawning surveys in Duxbury Bay in May and June and assist with tagging and re-locating horseshoe crabs. (Ongoing)
- South Shore RC will investigate potential for restoring mussel habitat, including a joint project with MassAudubon South Shore to assess the role of mussel spat as a food source for migratory red knots and conduct an initial analysis of soft-shell clam population structure in Scituate and Marshfield. (New)

Partners: municipal staff, DMF, CZM, MassAudubon, Division of Marine Fisheries, Mass. Coastal Zone Management

Deliverables and Milestones: horseshoe crab spawning survey data, including trends (Fall 2015), map and summary of mussel project (Winter 2016), cohort analysis of soft-shell clams (Winter 2016)

Long-term Outcomes: Improved habitat value and species conditions

CCMP Outcomes: MassBays reaches all planning-area municipalities with actionable information about estuaries; MassBays provides regular and locally informed State of the Bays reporting that reflects the unique characteristics and progress toward targets for planning area embayments.

CWA core program: (6) protecting coastal waters through the National Estuary Program

Communications and Outreach Planning and Implementation

Objective: respond to Program Evaluation, increase awareness of MassBays natural, educational, and information resources.

Description: While MassBays Central Staff develops a region-wide Communications Plan for MassBays, RCs will provide the following opportunities for local citizens to hear about the importance of natural resource protection and restoration:

- Underwater in Salem Sound Lecture Series
- Climate Change outreach, including a sample/template presentation that can be shared across the region.
- State of Salem Sound to Nahant Symposium
- Metro Boston outreach initiative, to share information about the Boston Harbor Habitat Atlas, online resources available from MassBays and others, opportunities for collaboration, and funding opportunities.

Deliverables and Milestones: This effort will be ongoing throughout the year; deliverables will include reports from individual and group meetings, lecture program listings, conference agendas, printed and online materials.

Long-term Outcomes: Informed local response to climate change impacts

CCMP Outcomes: MassBays reaches all planning-area municipalities with actionable information about estuaries.

CWA core program: (6) protecting coastal waters through the National Estuary Program

Critical Impact Area Projects

The projects below will be funded with up to \$61,000 per region, primarily for salaries (see Regional Service Provider budgets, Section D).

Contaminated and uncontrolled stormwater runoff (SW)

1. *Stormwater management technical support, education, and outreach (New and Ongoing)*
Objective: Provide technical support and outreach materials and services to municipalities to improve stormwater quality and reduce quantity.

Description: All RCs will promote stormwater best management practices, especially green infrastructure alternatives based on the Handbook completed last year. RCs will continue their support of newly formed Cape Cod Stormwater Managers Group and Upper North Shore Merrimack Valley Stormwater Management Collaborative to assist stormwater managers. Other specific tasks include:

- To reduce impacts of stormwater from the Route 3 corridor the South Shore RC will work with the South Shore communities along Route 3 and partner with Mass. Department of Transportation to assess and prioritize stormwater improvements that impact the North River, South River, Jones River, Town Brook, and Eel River. (New)
- Upper and Lower North Shore RCs will provide outreach and support re: Massachusetts MS4 permit through workshops, presentations, or personal discussions, mapping, and provision of public education materials through the Greenscapes program and CZM's Stormwater Solutions program, including infiltration, LID, and environmentally friendly landscaping. (New and Ongoing)
- Lower North Shore and Cape Cod RCs will identify and take advantage of opportunities to promote and implement Low Impact Development (LID) in subregion communities. (New and Ongoing)

Partners: Metropolitan Area Planning Council, Great Marsh and Cape Ann estuary and watershed communities, private contractors, and the Eight Towns and the Great Marsh Committee, 20 North Shore communities, SWIM, Ipswich River Watershed, Pioneer Valley Planning Commission

Deliverables and Milestones: training workshops, education and outreach products that can be used MassBays region-wide (ongoing); deliverables under state-funded grants to municipalities (proposals pending);

Long-term Outcomes: Stormwater management helps to improve water quality that supports healthy coastal ecosystems and sustainable human uses.

CCMP Outcomes: MassBays reaches all planning-area municipalities with *actionable information about estuaries*.

CWA core program: (4) addressing diffuse, nonpoint source s of pollution

2. *Adopt a Beach Program (Ongoing)*

Objective: To restore shoreline habitats

Description: Lower North Shore RC will train volunteer beachkeepers to remove marine debris and monitor their adopted area for resource degradation. Adopted areas include beaches, islands and river banks.

Partners: 400 trained beachkeepers, local DPWs and Park & Rec, SWIM

Deliverables and Milestones: List of training sessions and clean up events, map of beaches, islands and river bank adopted.

Long-term Outcomes: Increased stewardship of our natural resources including public awareness of the impacts of human behaviors on shoreline habitats, such as stormwater, marine debris, invasive species.

CCMP Outcomes: MassBays provides regular and locally informed State of the Bays reporting that reflects the unique characteristics and progress toward targets for planning area embayments.

CWA core program: (4) addressing diffuse, nonpoint source s of pollution

3. *Plankton and nutrient study; water temperature study (New and Ongoing)*

Objective: assess conditions and determine trends in Salem Harbor water quality

Description: Past work indicates that plankton are a major source of the turbidity in Salem Harbor. Little is known about this. Lower North Shore RC will work with Salem State University to develop a new study to explore the nature of the plankton and nutrients in the harbor. Nutrient sampling will continue. Following the closure of Salem Harbor Power Station on May 31, 2014, Lower North Shore RC will continue to monitor water temperature to document changes within the harbor when seawater is no longer being extracted and returned at a higher temperature.

Partners: Brewers Hawthorne Cove Marina, SSU, Sea Shuttle Inc.

Deliverables and Milestones: Public meeting, data trends and conditions assessment.

Long-term Outcomes: Improved water quality in Salem Harbor

CCMP Outcomes: MassBays reaches all planning-area municipalities with actionable information about estuaries; MassBays provides regular and locally informed State of the Bays reporting that reflects the unique characteristics and progress toward targets for planning area embayments.

CWA core program: (4) addressing diffuse, nonpoint source s of pollution

4. *Temporal and spatial expansion of open shellfish beds (Ongoing)*

Objective: prioritize and streamline water testing for shellfish bed categorization

Description: South Shore RC will work with partner communities to pursue stormwater and wastewater improvements in locations that impact shellfish beds, and with DMF to generate an approved priority list for sub-regional shellfish beds.

Partners: Towns of Scituate, Marshfield, Duxbury, Kingston, and Plymouth; Mass. Division of Marine Fisheries.

Deliverables and Milestones: Shellfish bed meetings (December 2015), DMF-approved priority list for South Shore shellfish beds (June 2016)

Long-term Outcomes: Increased acreage and duration of open shellfish beds on the South Shore

CCMP Outcomes: MassBays provides new resources for research and management in the Bays; MassBays provides regular and locally informed State of the Bays reporting that reflects the unique characteristics and progress toward targets for planning area embayments.

CWA core program: (4) addressing diffuse, nonpoint sources of pollution

Wastewater discharge (WW)

1. *Promote science-based wastewater management on Cape Cod (Ongoing)*

Objective: Support multiple efforts to establish sustainable wastewater management on the Cape.

Description: Cape Cod RC will work with partners to promote regional, science-based wastewater management through a variety of means: a) Continuing to host the Environmental Summit on Wastewater (a group of 35 NGOs convened in 2012 to build consensus on wastewater management), b) Continuing to serve on the Cape Cod Commission's 208 Monitoring Subcommittee that provides recommendations for monitoring wastewater management alternatives, c) Providing outreach videos and other materials at workshops and meetings, and d) Providing other technical assistance as needed.

Partners: APCC, 35 Cape Cod-based nonprofits, Cape Cod Commission, EPA, .

Deliverables and Milestones: Education and outreach materials, recommendations for monitoring

Long-term Outcomes: Improved near-shore water quality

CCMP Outcomes: MassBays reaches all planning-area municipalities with actionable information about estuaries.

CWA core program: (6) protecting coastal waters through the National Estuary Program

2. *Clean Beaches & Streams Program (New and Ongoing)*

Objective: To reduce bacterial contamination in Category 4 and 5 303d-listed waters

Description: Lower North Shore RC will identify bacterial pollution with biweekly summer water testing for Enterococcus at outfalls and streams throughout the Lower North Shore and notify the appropriate authorities of the results. Additional streams will be tested using the EPA Stormwater Equipment Toolbox to detect human wastewater.

Partners: Clean Beaches & Streams Network, volunteers

Deliverables and Milestones: Bacterial levels for 14 - 22 outfalls or streams and results from stream assessments, list of bacterial hot spots, and case study of at least one remediation effort by a municipality (October 2015)

Long-term Outcomes: Improved conditions to support habitat restoration

CCMP Outcomes: MassBays reaches all planning-area municipalities with actionable information about estuaries; MassBays provides regular and locally informed State of the Bays reporting that reflects the unique characteristics and progress toward targets for planning area embayments.

CWA core program: addressing diffuse, nonpoint sources of pollution

Barriers to streamflow and tidal flushing (TF)

1. ***Publish salt marsh monitoring data for restored marshes (New)***

Objective: Make salt marsh monitoring data accessible

Description: Between 2003 and 2014 APCC Wetland Biologist Tara Nye monitored more than 15 salt marshes to compare pre-restoration and post-restoration conditions. Reports were provided to state agencies but are not readily accessible otherwise. This information will be made available to resource managers, particularly as climate change and sea level rise may affect coastal wetlands. A short report would also help to build public support for protecting and restoring salt marshes. The Cape Cod RC will develop a short outreach report summarizing salt marsh monitoring data.

Partners: DER

Deliverables and Milestones: Draft outline with sample plots and graphics to inform Year 2 of the 2-year project (Spring 2016)

Long-term Outcomes: Better-informed restoration projects

CCMP Outcomes: MassBays provides new resources for research and management in the Bays; MassBays reaches all planning-area municipalities with actionable information about estuaries.

CWA core program: (5) protecting wetlands

2. ***Streamflow restoration (Ongoing)***

Objective: inform and support municipalities in their efforts to maintain appropriate streamflow in the midst of competing demands

Description: South Shore RC will work with the Towns of Scituate (First Herring Brook) and Norwell and Hanover (Third Herring Brook) to maintain ecologically appropriate flows within the context of municipal water demand and implement the results of the towns' previous state-funded sustainable water management initiative grants.

Partners: Towns of Scituate, Norwell, Hanover; Mass. Division of Ecological Restoration; Mass. Department of Environmental Protection

Deliverables and Milestones: Implementation of a streamflow improvement measure (June, 2016)

Long-term Outcomes: Improved streamflow in local rivers and streams

CCMP Outcomes: MassBays reaches all planning-area municipalities with actionable information about estuaries.

CWA core program: (6) protecting coastal waters through the National Estuary Program

3. *Dam removals (New and Ongoing)*

Objective: improve stream continuity and fish passage

Description: South Shore RC will work with multiple communities and partners to assess feasibility of and seek funding for removal of dams and other barriers and collect ecological data pre- and post-restoration. Projects will include Mill Pond Dam (post-restoration) and Tack Factory Dam (pre-restoration) on Third Herring Brook (Norwell/Hanover), multiple structures on the South River (Marshfield/Duxbury, pre-restoration), Hunters Pond Dam on Bound Brook (Scituate/Cohasset, pre-restoration), Elm Street Dam (pre-restoration) on the Jones River (Kingston), multiple structures on Town Brook (Plymouth, pre- and post-restoration), and Tidmarsh Farms/Fresh Pond (pre- and post-restoration) on Beaver Dam Brook (Plymouth).

Partners: Towns of Norwell, Hanover, Marshfield, Duxbury, Scituate, Cohasset, and Plymouth; Mass. Division of Ecological Restoration; Mass. Division of Marine Fisheries; NOAA Restoration

Deliverables and Milestones: Grant proposal to advance dam removal at one of the proposed sites (February 2016), summary report on dam removal efforts and progress (June 2016)

Long-term Outcomes: Increased access to stream-miles for fish and other wildlife

CCMP Outcomes: MassBays reaches all planning-area municipalities with actionable information about estuaries.

CWA core program: (6) protecting coastal waters through the National Estuary Program

4. *Fish run monitoring (Ongoing)*

Objective: build on existing volunteer herring monitoring program and maintain a reliable database regarding herring migration

Description: South Shore and Cape Cod RCs will recruit, train, organize, and support partners and volunteers to count river herring during upstream spring migration. RCs will collect and maintain data from water level and temperature data loggers in anadromous fish streams in the regions and continue to participate in the Herring Warden Network to improve and implement best management practices relevant to conducting herring counts and managing fish ladders.

Partners: DMF, municipal staff, River Herring Warden Network, NOAA National Marine Fisheries Service, local nonprofits, citizen-volunteers

Deliverables and Milestones: Draft 2015 herring run data report (Fall 2015), training sessions for volunteers (Spring 2016), final data report Spring 2016; workshop or other presentation (Spring 2016), outreach materials.

Long-term Outcomes: Well-informed resource management decisions

CCMP Outcomes: MassBays reaches all planning-area municipalities with actionable information about estuaries; MassBays provides regular and locally informed State of the Bays reporting that reflects the unique characteristics and progress toward targets for planning area embayments.

CWA core program: (6) protecting coastal waters through the National Estuary Program

Climate Change (CC)

1. Climate Change Resilience in the Great Marsh (New)

Objective: Ensure on-time and on-budget deliverables under a Hurricane Sandy/National Fish and Wildlife Foundation (NFWF) grant

Description: With support from the Upper North Shore RC, the Great Marsh Resiliency Team received \$2.9M NFWF funding to implement a suite of projects that should simultaneously reduce risk to coastal communities while increasing the resiliency of those ecological systems that those communities are dependent upon.

Partners: National Wildlife Federation, Parker River National Wildlife Refuge, Boston University, MassAudubon, Ipswich River Watershed Association, Woods Hole Group, University of New Hampshire/Jackson Laboratory, Marine Biological Lab, Center for Coastal Studies, all the Great Marsh communities

Deliverables and Milestones: Grant spans 3 years. This year's deliverables include: Phragmites and Pepperweed Control and Eelgrass Restoration, securing Student Conservation Association Researchers, hydrodynamic modeling data collection and modeling, gage installation and maintenance, community SLR planning, Great Marsh Revitalization Task Force meetings and communication.

Long-term Outcomes: Reduced risk from climate change impacts to coastal communities and increased resiliency of ecological systems

CCMP Outcomes: MassBays reaches all planning-area municipalities with actionable information about estuaries

CWA core program: (6) protecting wetlands

2. Impacts of sea level rise on water resources and infrastructure (Ongoing)

Objective: model and evaluate the potential effects of rising sea level on the mid-Cape's groundwater system

Description: Cape Cod RC will work with the USGS and partners in this 3-year project, and translate outcomes into public outreach materials, policies and adaptation measures. Potential effects include changes in stream baseflow, depth to groundwater, and changes in the subsurface saltwater-freshwater interface, which could impact infrastructure, wastewater management, water, wetlands, ecosystems, planning, and land use.

Partners: USGS, Cape Cod Commission, The Nature Conservancy, CRC.

Deliverables and Milestones: Results of modeling study summer 2015; literature review of adaptation measures, recommendations for adaptation measures, two workshops dates TBD.

Long-term Outcomes: Municipal and Cape-wide plans to respond to sea level rise

CCMP Outcomes: MassBays provides new resources for research and management in the Bays.

CWA core program: (6) protecting coastal waters through the National Estuary Program

3. Municipal Coastal Resiliency/Living Shorelines (New)

Objective: Assist municipalities in implementing coastal resiliency and living shoreline initiatives

Description: RCs will contribute to newly funded initiatives in the sub-region, including:

- Working under contract with the City of Salem, identify shoreline sites that will benefit from green infrastructure, engage the public through a forum and volunteer participation in the shoreline survey in order to communicate to residents the community-level adverse impacts

- and vulnerability of natural systems to climate change.
- Serve on the Manchester Coastal Resiliency Advisory Group to implement a state coastal resiliency grant, providing technical assistance, data collection and outreach support.
- Assist the Town of Truro to address coastal erosion and flooding by undertaking a tidal restoration project in the Upper Pamet River valley.
- Monitor coastal erosion and the role of natural communities in Brewster
- Assist Cape Cod Coastal Resources Commission to develop recommendations for County Commissioners for improving coastal resiliency.

Partners: City of Salem Planning Department and Chester Engineering, CZM Salem residents, Manchester-by-the-Sea staff and residents, Tighe & Bond, MCST, Barnstable County CRC members, Towns of Truro and Brewster

Deliverables and Milestones: Living Shoreline survey, public forum on coastal green infrastructure as a climate adaptation strategy, report on green infrastructure feasibility at the three sites selected, case study on lessons learned; schedule as laid out in grantee contracts

Long-term Outcomes: Local stakeholders will be engaged in efforts to expand living shorelines for habitat protection and storm/sea level rise impact mitigation.

CCMP Outcomes: MassBays provides new resources for research and management in the Bays; MassBays reaches all planning-area municipalities with actionable information about estuaries.

CWA core program: (6) protecting coastal waters through the National Estuary Program

4. *Salt Marsh Monitoring for Climate Change Impacts (Ongoing)*

Objective: establish and implement monitoring protocols suitable for volunteers

Description: Upper North Shore RSP and Lower North Shore RSP will monitor salt marshes in Plum Island Sound/Great Marsh, Good Harbor Marsh (Gloucester), Juniper Cove (Salem) and Old Creek Marsh (Salem) with help from citizen volunteers; South Shore RC will establish multiple permanent transects along the North River for long-term monitoring of vegetation change, including conversion of high marsh to low marsh and brackish marsh to salt marsh.

Partners: North River communities, Friends of Good Harbor, Waquoit Bay National Estuarine Research Reserve, CZM, UNH, LTER, RSPs, Salem State University, Boston University

Deliverables and Milestones: Citizen science protocols to monitor long-term climate change impacts on salt marshes from sea level rise, documentation of monitoring efforts (December 2015), map and photos of established transects on the North River (June 2016).

Long-term Impacts: Increased understanding of salt marsh response to sea level rise; increased capacity among citizen volunteers.

CCMP Outcomes: MassBays provides new resources for research and management in the Bays; MassBays provides regular and locally informed State of the Bays reporting that reflects the unique characteristics and progress toward targets for planning area embayments.

CWA core program: (6) protecting wetlands

Spread of Invasive Species (IS)

1. *Invasive species treatment and control*

Objective: To control emergent and existing *Phragmites* stands, control invasive pepperweed and purple loosestrife, and devise controls for green crabs

Description: Several of the RCs will continue efforts to control and eradicate invasive species that reduce ecosystem value of habitats:

- Upper North Shore RC will treat Phragmites in the Great Marsh, and post-treatment monitoring to determine impact of previous treatment efforts, obtaining permits, and perform small scale treatment for an estimated 15 acres of Phragmites (New and Ongoing)
- Lower North Shore RC will lead pepperweed education and removal efforts to limit its spread as part of a New England-wide community-based mapping and control effort. Upper North Shore RC will also continue the in-the-field monitoring of pepperweed in estuarine areas that have not yet been evaluated and complete finer mapping of non-accessed, known sites. Activities will also consist of pepperweed pulling and chemical treatment. (Ongoing)
- Upper North and South Shore RCs will participate in a New England-wide effort to standardize green crab monitoring protocols, including testing burrow count and crab trapping protocols. (New on the South Shore; Ongoing on the Upper North Shore)
- South Shore RC will implement an effort to control purple loosestrife at the site of the recently removed Mill Pond Dam with *Galerucella* beetles. (Ongoing)

Partners: Mass Audubon, Parker National Wildlife Refuge, MA-NH- ME Invasive Group, SWIM, Saugus River Watershed Association

Deliverables and Milestones: Documentation of volunteer efforts, mapping of known and treated sites; report on purple loosestrife treatment.

Long-term Outcomes: Improved habitat value

CCMP Outcomes: MassBays provides regular and locally informed State of the Bays reporting that reflects the unique characteristics and progress toward targets for planning area embayments.

CWA core program: (6) protecting coastal waters through the National Estuary Program

2. *Invasive Species Monitoring (Ongoing)*

Objective: maintain state-wide database of introduced species

Description: Working with citizen monitoring groups, Upper and Lower North Shore RCs monitor multiple established field sites for non-native species. Data are provided to CZM program for inclusion in online coastal maps.

Partners: CZM, MIT Sea Grant, volunteers

Deliverables and Milestones: Photo documentation of monitoring (Fall 2015); data submitted to CZM MIMIC coordinator (December 2015)

Long-term Outcomes: Increased understanding of the transport, population dynamics, and impacts of invasive species, early detection of newly arriving invasive species.

CCMP Outcomes: MassBays provides regular and locally informed State of the Bays reporting that reflects the unique characteristics and progress toward targets for planning area embayments.

CWA core program: (6) protecting coastal waters through the National Estuary Program

D. Budget

Budget Narrative

Assumptions

Section 320 funding allocation to MassBays is \$600,000.

MassBays has received supplemental funds from one additional source, making \$320 funds available for other purposes. Specifically, \$2,976 in National Coastal Condition Assessment funds will be applied to salaries, fringe, and indirect charges for the Staff Scientists' time to coordinate the Massachusetts effort.

Proposed Spending (Table 1)

Salaries and Fringe for two staff: Executive Director (1.0FTE), and Staff Scientist (0.6FTE).

These include annual STEP (union-negotiated) increases for MA FY2016. Fringe rate is 30.82% of salaries.

Contractual - sub-grants

- Regional Service Providers. Up to \$61,000 is allocated to each of the four RSPs, and up to \$50,000 for a fifth RSP in Metro Boston region. This year we request a total of \$293,728 to come from the Section 320 base grant monies. Regional partners, in their proposals to serve as RSPs to MassBays, identify sources of match for the program. These funding sources are linked directly to the implementation of the CCMP. Each of the RSP applicants has identified a substantial cash and in-kind match as detailed above. Sources of match offered include revenue from membership, state and local grants, local donors, etc., as well as the work of staff within these organizations on projects specifically related to our estuarine restoration and conservation efforts.
- CCMP Implementation Grants. The proposed budget includes \$91,000 for a MassBays CCMP Implementation Grant Program. This funding initiative is the successor to our previous Research and Planning Grant program, revamped based on five successful years of funding local partners. More details regarding plans to revise the program are in New and Ongoing Project descriptions, above. The grant program will require a minimum 25% match of the total project cost (or 33.3% of the MassBays contribution)
- Estuary restoration and assessment tool. The proposed budget includes \$20,000 to update the Estuary Delineation and Assessment Report (completed in 2012) with additional parameters that will support cross-region comparison of like embayments (see description, page 19).

Travel (Table 2)

- NEP national meetings
 - Spring Annual Meeting, Washington DC (Director)
 - Fall Technical Transfer, San Juan, PR (Director)
- Other Professional Development Conferences
 - Assuming limited travel expenses and registration fees for professional development and regional conferences, New England-wide (Director and Staff Scientist)
- Sub-regional meetings, workshops, and site visits
 - CCMP implementation oversight, regional education & outreach workshops, meetings with RSPs, etc., MassBays-wide (Director)
- NE Regional NEP meetings
 - Visits for collaboration and joint programming discussions, New England-wide (Director and Staff Scientist)

Other Expenses

- Meeting supplies: The budget includes a modest allocation of \$1426 to support Management Committee meetings, and regional meetings regarding the final CCMP.

- Shared Agency Expenses. The current budget provides \$5000 to our host agency, CZM, to offset costs of services including program-level fiscal management, computers and phones, day-to-day printing capacity, and internet access. Note the difference between this and Indirect Charges, below.

Indirect Charges

Indirect charges (15.48% on salaries and subcontracts) allocate monies directly to the Commonwealth, to support state-level administrative and overhead costs.

Matching Funds

RSPs have committed \$176,448 in direct institutional match to their scopes of work. A minimum 25% match is required of all Research and Planning Grant applications, a total of \$7500 for this year. In addition, specific project work to be carried out under the current proposal has been matched by \$358,319 from private foundations, municipalities, and state monies, as indicated in Table 3, below.

Table 1. Detailed Budget

FFY15 Section 320 Grant Application: Massachusetts Bays National Estuary Program Proposed Expenditures and Confirmed Non-Federal Match	
Personnel (incl. Massachusetts STEP increase)	
Executive Director, 1.0FTE	\$ 82,553
Staff Scientist, 0.6FTE	\$ 43,502
salaries	\$ 126,055
Fringe	
Fringe @ 30.82% (salaries)	\$ 38,850
subtotal, salaries & fringe	\$ 164,905
Travel (see detail, Table 2)	
subtotal, travel	\$ 5,487
Contractual - Subgrants	
Regional Service Providers	\$ 293,728
CCMP implementation grants	\$ 91,000
Estuary assessment tool	\$ 20,000
subtotal, subgrants	\$ 404,728
Other Expenses	
meeting supplies	\$ 1,426
shared agency expenses	\$ 5,000
subtotal, other expenses	\$ 6,426
Indirect	
Indirect Charges @ 14.64% (salaries)	\$ 18,454
Total Request, FFY15	\$ 600,000
Matching Funds (see detail, Table 3)	
Direct Match from RSPs	\$ 150,151
Direct Match from R&P Grant recipients	\$ 27,750
Direct Project Match	\$ 422,222
Total Match, FFY15	\$ 600,123

Supplemental funds	Source
\$ 7,379	carryover (Blue Carbon)
\$ 3,861	NCCA, carryover (Blue Carbon)
\$ 11,240	
\$ 1,190	NCCA, carryover
\$ 12,430	

Table 2. Travel Detail

FFY2015 Proposed Travel Expenditures					
destination (# travelers)	airfare	meals	ground transportation	lodging	registration
NEP national meetings					
Spring (Washington DC) 4d (1 traveler)	250	120	100	600	400
Fall (San Juan, PR) 4d (1 traveler)	400	120	100	600	400
Other PD/Regional Conferences (2 attendees)		180	215	250	800
Regional meetings and site visits for CCMP implementation, regionwide education & outreach, etc. (assume two trips per site)			1 car @ \$.53/mi		
Salem x2	0	20	42.4		
Newburyport x2	0	20	84.8		
Kingston x2	0	20	76.32		
Wellfleet x2	0	20	216.24		
NE Regional NEP meetings (2 travelers)			1 car @ \$.53/mi		
Portland ME	0	60	116.6		
Narragansett RI	0	60	84.8		
Durham NH	0	60	71		
subtotals	\$ 650	\$ 680	\$ 1,107	\$ 1,450	\$ 1,600
Total Travel	\$ 5,487				

Table 3. Direct Project Match Detail

Task/region	amount	type	source
CC2/Cape Cod	\$20,000	Cash	MET grant
SW1, WW1/Cape Cod	\$60,150	Cash, in-kind	private foundations
CC3/Cape Cod	\$17,522	Cash, in-kind	private foundations
TF4/Cape Cod	\$12,800	Cash, in-kind	APCC internship fund
CRE, eelgrass/South Shore	\$6,000	In-kind	State agency staff
TF3/South Shore	\$21,250	Cash, in-kind	non-Federal funds
TF4/South Shore	\$6,000	In-kind	volunteers
IS1, IS2/Upper North Shore	\$107,500	Cash, in-kind	MassAudubon, non-Federal funds, volunteers
CC4/Upper North Shore	\$25,000	In-kind	academic partners
CC1/Upper North Shore	\$10,000	Cash, in-kind	non-Federal funds
SW1/Lower North Shore	\$31,000	Cash	municipal fees
CC3/Lower North Shore	\$100,000	Cash, in-kind	City of Salem, non-Federal funds
Communications & Outreach/Lower North Shore	\$5,000	In-kind	non-Federal funds
Total confirmed	\$422,222		